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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Roger W. Whatmore

THOR/0008

7985

7590

07/06/2004

MOSER, PATTERSON & SHERIDAN, L.L.P.

Suite 1500

3040 Post Oak Blvd.

Houston, TX 77056

EXAMINER

TRINH, HOA B

ART UNIT

PAPER NUMBER

2814

DATE MAILED: 07/06/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/005,883	WHATMORE, ROGER W.	
	Examiner	Art Unit	
	Vikki H Trinh	2814	<i>aw</i>

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-34 is/are pending in the application.
 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 5, 8-11, 13, 16-22 and 27-34 is/are rejected.
- 7) ☒ Claim(s) 4, 6, 7, 12, 14, 15 and 23-26 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>0604</u> . | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. Claims 1- 3, 5, 8, 9-11, 13, 16, 17-22, 27-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Solomon (5,030,828) in view of Thomas et al. (4,369,458).

Solomon discloses a method of fabricating a radiation detector array comprising the steps of: a) providing on one face of a layer of material, an array of detector elements 28 (col. 6, lines 8-14), and b) forming an array of cavities 13, 36 in the layer of material such that each detector is positioned at the base of a cavity (fig. 1).

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However, Solomon does not teach the step of c) bonding the array of cavities and detectors to a silicon integrated circuit including a corresponding array of amplifiers and multiplex switches.

Thomas et al. '458 teaches a method of making a radiation array having the steps of bonding (col. 2, lines 33-50) the array cavities 30, 32, 34 and detectors 28, 26, 38, 40, 58 to a silicon IC including the array of amplifiers and multiplex switches (figs. 2-3).

Therefore, as to claims 1, 9, it would have been obvious to one skilled in the art at the time the invention was made to modify the invention of Solomon with the bonding step, as taught by Thomas et al., so as to provide parallel interconnections with the bonding of the arrays. (Thomas et al., Col. 2, lines 4-14). As to claim 17, the method above produces an array as claimed.

As to claims 2-3, 10-11, the layer of material is a silicon wafer 10 and the cavities 13 are formed by ion etching the wafer. Fig. 1 and Col. 6, lines 50-55.

As to claims 5, 13, 29, 35, the method and device includes partially coating the cavities with metal. The examiner interprets that the metal coating with conical shape of the cavity is the lens for performing the same function, i.e. for providing the angular collection efficiency, as stated in claim 30. Col. 6, lines 10-15.

As to claims 8, 16, 31-32, the method further including the step of wholly or partially filling the cavities with dielectric material of refractive index higher 18 (col. 6, lines 12-15) than air.

As to claim 18, the elements are infrared detector elements. Thomas et al., Col. 1, line 11.

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As to claims 19-22, the cavities have a gradually reducing cross sectional area such as a conical or parabolic shape. See figs. 2-3.

As to claims 27-28, the bonding step include the conductive bumps 106, 108, 112 made of solder (Thomas et al., fig. 4).

As to claims 33-34, the detector elements 90 have a thin film absorber such as a silicon dioxide coated with a thin layer of metal. Thomas et al., Col. 9, lines 24-28.

Allowable Subject Matter

Claims 4, 6-7, 12, 14-15, 23-26 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:
The prior art of record does not disclose or fairly teach either in singly or in combination a method and device for a radiation detector array comprising a profiled polymer mask used to define the array of cavities, a metal coating is sputtered onto the cavities, wherein the metal is evaporated onto the cavities, and other elements and steps in the claims.

LONG PHAM
PRIMARY EXAMINER

Conclusion

1. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Vikki Trinh whose telephone number is (571) 272-1719. The Examiner can normally be reached Mon-Tuesday, Thurs-Friday, 7:30 AM - 6:00 PM Eastern Time. If attempts to reach the examiner by telephone are unsuccessful, the Examiner's supervisor, Mr. Wael Fahmy, can be reached at (571) 272-1705.

Vikki Trinh,
Patent Examiner
AU 2814